Parents' Perceived Barriers to Healthful Eating and Physical Activity for Low-Income Adolescents Who are at Risk for Type 2 Diabetes

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Abstract

Healthful eating and regular physical activity are vitally important for low-income adolescents who are at risk for developing type 2 diabetes (T2DM). To design a relevant, community-based intervention for these at risk adolescents, parent perceptions of barriers to healthful eating and physical activity should be assessed. Such barriers have been reported for adolescents in general, but not for parents of low-income adolescents. The purpose of this study was to identify parents' perceived barriers to healthful eating and physical activity for low-income adolescents who are at risk for T2DM. Ten parents completed interviews. Transcripts were independently coded by four graduate assistants not familiar with the project. NVIVO 8 software was used to further validate findings. Parents identified several barriers to healthful eating: (a) child's preference for *junk foods*, (b) easy access to fast food or junk foods, (c) parent's lack of time, and (d) family member's food preferences; and common barriers to physical activity: (a) lack of access to affordable and age-appropriate programs, (b) child's preference for sedentary activities, lack of motivation, and (c) lack of confidence/ self-conscious about exercising. Results can be used to design a community-based intervention that specifically addresses these barriers for low-income adolescents who are identified to be at risk for T2DM.

Introduction

Traditionally, T2DM was also referred to as adult onset diabetes because it was commonly diagnosed in adults over the age of 50 and rarely diagnosed in children. Recently, the incidence of T2DM in children and adolescents has increased dramatically, and has been described by various experts as alarming (Copeland, Becker, Gottschalk, & Hale, 2005), a new epidemic (Kaufman, 2002), and an emerging disease (Brosman, Upchurch, & Schreiner, 2001). The problem is not unique to the United States, and the global spread of T2DM in children and adolescents has been noted in many other countries throughout the world (Pinhas-Hamiel & Zeitler, 2005; Wiegand et al., 2004).

Because the concept of children with T2DM is relatively new, many gaps in research exist. For example, the National Diabetes Education Program is actively trying to determine how many children currently have T2DM (the SEARCH for Diabetes in Youth Study) and the Treatment Options for Type 2 Diabetes in Adolescents and Youth (TODAY) Trial is attempting to find effective methods of treating T2DM in children (Diabetes in Children, Adolescents Work Group of the National Diabetes Education Program, 2004).

The American Diabetes Association (ADA) (2000) suggests a child is at risk for T2DM if he/she has a Body Mass Index (BMI) above the 85th percentile for age/sex and any two of following: belonging to an ethnic minority, family history of T2DM, or signs of insulin resistance (which include acanthosis nigricans, hypertension, dyslipidemia, or polycystic ovarian syndrome). Public Act 93-0530 states that the State of Illinois will screen for T2DM during the 6th grade and 9th grade school physicals (Illinois Department of Human Services, n.d.). If a child is found to be at risk, some type of intervention should be recommended. However, few recent school-based interventions of these high risk children have been reported (Grey et al. 2004; Rittenbaugh et al. 2003; Rosenbaum et al. 2007; Shaw-Perry et al. 2007). In fact, a recent review of school-based diabetes prevention programs revealed only seven peer-reviewed articles over the past 20 years (Gittlesohn & Kumar, 2007). The authors recommend that future diabetes prevention programs for children should move outside of the school setting and into the community.

Incorporating community-based resources and the support of family members may increase sustainability of lifestyle changes and help convey the importance of such changes to at risk adolescents. However, very few studies have reported results of community-based lifestyle interventions for adolescents who are at risk for T2DM (Davis et al. 2007; Long et al. 2006). These preliminary studies suggest that a community-based intervention could be effective in reducing some dietary risk factors for T2DM.

Developing a community-based intervention for these adolescents is challenging due to a wide range of developmental stages, apathy, peer pressure and/or body image issues. For example, an after-school program for urban Native American youth to improve dietary self-efficacy was effective for 5-10 year old children but not for adolescents in the study (Rinderknecht & Smith, 2004). These authors noted a need for greater understanding of personal, environmental and behavior constraints of adolescents.

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Transitioning from childhood to adulthood can be a time of many changes and emotional challenges. Social values, self-esteem, and self-efficacy are formed, but also views and habits related to health, physical activity, and food choices are established during this time. Additional difficulties emerge when trying to intervene with low-income adolescents due to barriers unique to families with limited resources. Food insecurity complicates the issue of healthful eating, especially with regard to food cost and access to healthful foods in low-income areas (Evans, Wilson, Buck, Torbett & Williams, 2006).

To better understand factors that influence adolescents' eating behaviors, researchers at the University of Minnesota have proposed a conceptual framework based on Social Cognitive Theory and an ecological perspective with four levels of influence (Story, Neumark-Sztainer, & French, 2002). The first level is Individual Influences on eating behavior, which includes psychosocial factors, biological factors, behavioral factors, and lifestyle factors (i.e., taste, hunger, cost, time, convenience, attitudes, beliefs, knowledge and self-efficacy). Social and Interpersonal Factors (second level) are those that are strongly influenced by peers, family, and friends. Examples would include modeling and reinforcement of eating behaviors, social support and perceived norms. The third level is Physical Environment and Community Influences, including factors such as food availability at schools, various types of restaurants, shopping malls, vending machines and convenience stores. The fourth level of influence is Macrosystem and Societal Factors. Examples include mass media and advertising, social and cultural norms about eating, food production and distribution, and local/state/federal food-related policies. Because this comprehensive model is theory-driven and is recommended for understanding adolescents' eating behaviors (Story et al.), it was used as a starting point to determine parents' perceived barriers to healthful eating and physical activities for low-income adolescents at risk for T2DM.

Barriers to Healthful Eating

Much previous research has identified barriers to healthful eating for adolescents in general (Bauer, Yang, & Austin, 2004; Evans et al., 2006; Jenkins & Horner, 2005; O'Dea, 2003; Stevenson, Doherty, Barnett, Muldoon, & Trew, 2007). It is interesting to note the various ways that adolescents' barriers to healthful eating are organized in these studies. Major categories of barriers in an Australian study included (a) convenience issues, (b) internal/physiological preferences, (c) social reinforcement, and (c) rewards/mood enhancement (O'Dea). A study done in the U.K. sorted barriers according to (a) physical and psychological aspects of food, (b) lack of personal responsibility for healthful eating, (c) conflicting messages about unhealthful foods vs. social pressure for thinness, and (d) perceptions of the need for dieting vs. healthful eating (Stevenson et al.). A recent review of barriers that influence adolescents' eating behavior (Jenkins & Horner) organized studies into (a) adolescents' eating patterns, (b) family effects, (c) school effects, and (d) community effects. This framework is remarkably similar to the first three levels used in the current study (i.e., individual, social, and community influences).

Taste preferences and lack of time are mentioned as common barriers to healthful eating in most studies. Easy access to junk foods, limited availability of healthful foods, lack of family meals due to parent work schedules, lack of concern about overall health, convenience, food cost, peer/ social factors, and weight concerns were also mentioned. One key study specifically assessed barriers to healthful eating for low-income families (Evans et al., 2006). Five themes emerged: (a) easy access to unhealthful foods, (b) bad taste of healthful foods, (c) social pressure to eat junk foods, (d) appearance of healthful foods, and (e) lack of variety.

Another unique study explored barriers to healthful eating in 141 youth with type 1 diabetes (Gellar, Schrader, & Nansel, 2007), with a specific focus on the influence of family, friends, and school. Major barriers for these adolescents were: (a) widespread availability of unhealthy foods especially at school and sometimes at home, (b) preparation time/convenience of pre-packaged foods, (c) peer interactions, and (d) busy schedules/lack of time to prepare a healthy meal. Even though these studies targeted different populations, both indicate that easy access to junk foods is perceived as a barrier to healthful eating for adolescents. The family context of eating and mealtime patterns is also important. Seibold, Knafl and Grey (2003) interviewed ten families of at risk adolescents and concluded that effective interventions to prevent T2DM in youth should include parents in both cognitive and behavioral strategies.

Barriers to Physical Activity

Regular physical activity is critical for reducing risk factors. To our knowledge, no studies of barriers to physical activity for at risk adolescents have been reported. However, many studies of barriers to physical activities for adolescents in general have been completed (Bauer et al., 2004; Hesketh, Waters, Green, Salmon, & Williams, 2005; Kimm et al. 2006; O'Dea, 2003; Robbins, Pender, & Kazanis, 2003; Romero, 2005). For example, Robbins and colleagues identified barriers to physical activity reported by a diverse group of young adolescent girls. Top barriers identified were self-consciousness when exercising, and lack of motivation to be active. The authors noted one of the most consistent modifiable factors for promoting physical activity among youth was addressing perceived barriers to physical activities. Commonly-reported barriers to exercise for male and female adolescents included lack of time, lack of energy and/or motivation, preference for sedentary activities, lack of confidence, fear of injury, lack of support from family/ friends, lack of access to equipment/ facilities/ programs, and cost of facilities/programs.

One study assessed barriers for low-income adolescents (Romero, 2005) and found that low quality facilities, cost of facilities, and lack of safe adults at facilities were major

barriers to after-school exercise programs. Of note, most of these physical activity studies used Social Cognitive Theory as a framework for their research, and three of these key studies simultaneously assessed barriers to healthful eating and physical activities in adolescents (Bauer et al., 2004; Hesketh et al., 2005; O'Dea, 2003). However, two of these studies took place in Australia, and none targeted at risk adolescents.

Community-based interventions are needed to promote sustainable lifestyle changes such as regular family mealtimes and consistent physical activity for at risk low-income adolescents. Identifying important barriers to physical activity and healthful eating is crucial for developing an effective community-based intervention for these adolescents. Therefore, the purpose of this study was to identify parent's perceived barriers to healthful eating and physical activities for low-income adolescents who are at risk for T2DM.

Methods

Students in sixth through eighth grade at a middle school (n = 246) in Southern Illinois had previously participated in a noninvasive screening process to determine whether they were at risk for T2DM. In addition to ADA risk factors (high BMI for age, family history, racial/ethnic background, the presence of acanthosis nigricans, high blood pressure) low physical activity (less than two hours/day, including 45 minutes physical education class) plus high screen time (more than 2 hours of television, video games, or computer) was used to determine risk status as this factor has been reported in previous studies (Fulton-Kehoe, Hamman, Baxter, & Marshal, 2001; Hu et al. 2001).

Fifty-four of those screened exhibited three or more of the six risk factors. The school nurse notified parents in writing that their child had three or more risk factors for T2DM. Parents were also informed regarding the opportunity to participate in an upcoming study. Twenty-four of these 54 parents gave the school nurse permission to release their contact information so they could be invited to participate. All 24 parents were called numerous times. Ten parents agreed to participate in the study, yielding a 42% response rate. The incentive provided was a $50 gift card to Wal-Mart. The decision to target the parents instead of the adolescents for this study was due to the school nurse's request to contact the parents first, and the researchers' concern about the increased need for confidentiality when working with minors. This study was approved by the Human Subjects Committee at Southern Illinois University Carbondale.

A team of two researchers conducted face-to-face interviews with a parent in their home when possible. In instances where face-to-face interviews were not possible (n = 3; when the parent refused to have the researchers come to their home), phone interviews were offered as an option. The interviewer first asked each parent open-ended questions about the family's overall physical activity patterns and eating habits. Then the interviewer used common barriers to healthful eating and physical activity for adolescents as a framework to discuss parent's perceived barriers to physical activity and healthful eating habits for their at-risk adolescent.

Specifically, parents were asked: (a) "Are you aware of any barriers that prevent your child from doing physical activity on a regular basis?" (b) "Are you aware of any tools or services you think would help your child be more physically active?" (c) "Are you aware of any barriers that might keep the rest of your family from becoming more physically active?" (d) "Are you aware of any barriers that prevent your child from eating healthful foods on a regular basis?" (e) "What would be the hardest part about getting your child to eat healthier foods?" and (f) "If you decided to provide more healthful types of foods, how do you think it would affect your family?" Demographic information was also collected including education level of the parent, annual family income, and family size. Interviewing the parent provided the necessary information to capture their perceived barriers to healthful eating and physical activities in order to design a relevant intervention that addresses their specific barriers.

Each interview was audio-taped and transcribed verbatim. Common themes were identified across interviews and an initial coding system was created, including a description of each coding category. Four research assistants then independently coded all transcripts by assigning coding categories to responses. Inter-rater reliability was 80%. The research team discussed any coding discrepancies until a consensus was reached. The qualitative software program NVIVO 8 was used to facilitate data management and coding.

Results

Fifty percent of the families reported their race/ethnicity to be African American or biracial. A positive family history for T2DM in a first-degree relative was reported by 60% of the parents. Eight of the 10 parents reported an annual family income of $30,000 or less, while the other two families reported incomes of $40,000-$50,000. Number in household ranged from 2 to 7, with a mean of 4.3. When family size was taken into consideration, 7 of the 10 families would qualify for food stamps according to the 2007 guidelines (U.S. Department of Agriculture, 2009). Education level of the head of household was most commonly reported as some college (60%), with 20% reporting college degree and 20% reporting high school or GED.

Parents' Perceived Barriers to Healthful Eating

Parents most frequently expressed frustration due to their child's preference for junk food. A common theme indicated that even when healthful foods were available their child would choose the junk foods. One mother described her sons as *clever* at finding ways to buy and eat junk foods. This mother said, "You know, I can cook a nutritious meal and they don't even touch half of it." When asked if she

thought her family would benefit from experimenting with new foods to encourage new food preferences this mother replied, "I try new recipes all the time because I like to cook. I'll be honest with you, I don't think so. I doubt they would even try it."

Interestingly, another common barrier mentioned by parents was easy access to junk foods and fast foods at home, school, and in the neighborhood. One mother stated, "Most days we eat processed foods; stuff that he can prepare on his own. And the school lunches have gotten to where they are more processed." Another mother shared, "They serve pizza 99% of the time at school, or else ravioli, hamburgers, or chicken patties."

Another perceived barrier to healthful eating expressed by parents was parent's lack of time. The mother's work schedule often interfered with family mealtimes, which allowed the adolescent to eat foods that were not healthful. Lack of time was related to the family's increased use of fast foods and junk foods due to convenience. One mother shared, "There are times when I get home from work and she's already eaten something, usually junk." One parent expressed feelings of guilt and blame for her son's unhealthy eating habits due to her working so much. She said, "Maybe as a parent, I should take more initiative in preparing the right food and making an effort to get out and do things outside with him. I really put the blame on me." Other healthful eating barriers mentioned by parents to a lesser extent were: (a) other family member's food preferences, (b) lack of child's concern about health, (c) taste/appearance of healthful foods, (d) cost of healthful foods, (e) lack of family support, (f) cravings/emotional eating, and (g) child's weight concerns/ meal skipping.

Parents' Perceived Barriers to Physical Activity

Analysis of the transcripts also revealed a variety of perceived barriers to physical activities. The top barrier to physical activity was lack of affordable, age-appropriate programs/facilities in the town. According to the parents, many of their adolescents had previously participated in local park district programs or church-based programs; however, these programs had been discontinued, or had an age limit that left low-income adolescents with few options for physical activity outside of physical education classes.

Another frequently cited barrier was the child's preference for indoor, sedentary activities, such as playing video games/computer games/watching TV. It is interesting to note that parents who cited video games as a barrier to physical activity often shared that their adolescent was frequently at home alone due to mother's work schedule which restricted the child's options to indoor activities.

A third important barrier mentioned by parents was the lack of motivation and self-discipline on the part of the adolescent. Parents said they tried to encourage their child to become more active but the child showed little or no interest. One parent expressed frustration with getting her family more physically active, "We pretty much know what to do, it's just getting the family to do it." Another parent described her son as "hard to motivate" with regard to physical activity. Each parent was aware of the need to become more active and expressed a desire to learn ways to increase physical activity for their family.

Lack of confidence in ability and/or self-conscious about exercising was also mentioned frequently. Other barriers were: (a) lack of time (due to homework, chores, family activities), (b) lack of energy/sluggish/fatigued/depressed, (c) safety of facilities/programs, (d) lack of family/teacher support, (e) lack of an exercise buddy/playmate, (f) fear of injury/discomfort, (g) unsuitable weather, (h) lack of access to equipment at home, and (i) lack of a physically-active role model.

Discussion

Parents' perceived barriers are important for health educators to understand when attempting to intervene with any group of children. This study was designed to identify parents' perceived barriers to physical activity and healthful eating for low-income adolescents who are at risk for T2DM. Many important barriers were found for both healthful eating and physical activity, representing multiple levels of influence. They can be meaningfully organized using the framework proposed by Story et al. (2002), which has its roots in Social Cognitive Theory.

For healthful eating, the most commonly cited barrier (preference for junk foods) and many other barriers were Level 1 (Individual Influences), including: (a) lack of concern about health, (b) taste/appearance of healthful foods, (c) cravings/emotional eating, and (d) weight concerns. Common Level 2 factors (Social and Interpersonal Influences) included: (a) easy access to junk foods, (b) parent's lack of time, (c) family member's food preferences, and (d) lack of family support. These barriers are similar to barriers reported for adolescents in general (Bauer et al., 2004; Evans et al., 2006; Jenkins & Horner, 2005; O'Dea, 2003; Stevenson et al., 2007). The main Level 3 factor (Physical Environment and Community Influences) reported in this study was easy access to fast food and junk foods at school and in the neighborhood, which was also reported by Jenkins and Horner (2005). These food-related barriers can be specifically targeted when planning community-based interventions. For example, lack of concern about health could be addressed by having a person with diabetes explain what it is and demonstrate how to check blood sugars. In addition, simple and low-cost, healthful food could be prepared and tasted by participants to increase the likelihood of making it at home.

For physical activity, the most common barrier was lack of access to programs (a Level 3 barrier involving the physical environment and community). Additional commonly cited barriers included: (a) child's preference for indoor/ sedentary activities, (b) child's lack of motivation, (c) lack of confidence in ability (d) lack of time, (e) lack of energy, and (f) fear of injury (all Level 1 barriers involving individual influences). Similar results have been reported by others

(Romero, 2005). Of note, lack of confidence in ability sounds remarkably similar to the concept of self-efficacy (a key component of Social Cognitive Theory), and was identified in this study as an important component for interventions targeting adolescents.

Commonly cited social and interpersonal barriers (Level 2) included: (a) lack of family support, (b) lack of an exercise buddy, and (c) lack of a role model. Other Level 3 barriers mentioned less often were: (a) safety issues related to facilities/programs, and (b) unsuitable weather conditions. Again, these barriers are similar to those reported for adolescents in general. Lack of access to fitness programs could be addressed by providing participants with a free membership to a local fitness center, which has the potential to decrease participants' preference for sedentary activities and improve their motivation/energy levels, and self-confidence.

Overall, barriers for both topics were most likely to be related to Individual factors; however, many Social/ Interpersonal and some Physical Environment/Community influences were found for each topic area. Potential weaknesses of this qualitative study include the small sample size and that three of the interviews were completed over the phone instead of in-person.

To our knowledge, no studies have reported parents' perceived barriers to healthful eating and physical activity for low-income adolescents who are at risk for T2DM. Addressing parents' perceived barriers when designing a community-based intervention could significantly improve outcomes for these adolescents. Results of this study will be used to design a relevant, community-based intervention for low-income adolescents who are at risk for T2DM.

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